

# 2SD1277, 2SD1277A

Silicon NPN Triple-Diffused Planar Darlington Type

Medium Speed Switching

Complementary Pair with 2SB951, 2SB951A

## Features

- High DC current gain ( $h_{FE}$ )
- High speed switching
- "Full Pack" package for simplified mounting on a heat sink with one screw

## Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ )

| Item                        | Symbol    | Value           | Unit             |
|-----------------------------|-----------|-----------------|------------------|
| Collector-base voltage      | $V_{CB}$  | 60              | V                |
|                             |           | 80              |                  |
| Collector-emitter voltage   | $V_{CE}$  | 60              | V                |
|                             |           | 80              |                  |
| Emitter-base voltage        | $V_{EB}$  | 7               | V                |
| Peak collector current      | $I_{CP}$  | 12              | A                |
| Collector current           | $I_C$     | 8               | A                |
| Collector power dissipation | $P_C$     | 45              | W                |
|                             |           | 2               |                  |
| Junction temperature        | $T_J$     | 150             | $^\circ\text{C}$ |
| Storage temperature         | $T_{stg}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

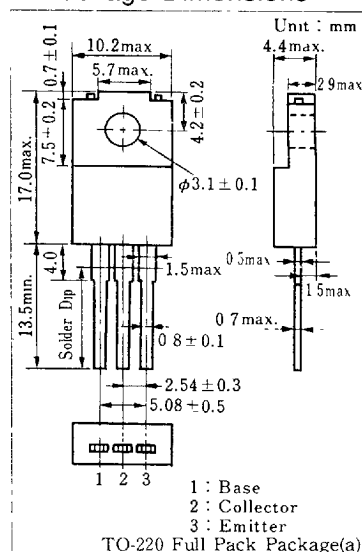
## Electrical Characteristics ( $T_c=25^\circ\text{C}$ )

| Item                                 | Symbol        | Condition                                                                         | min. | typ. | max.  | Unit          |
|--------------------------------------|---------------|-----------------------------------------------------------------------------------|------|------|-------|---------------|
| Collector cutoff current             | $I_{CB}$      | $V_{CB}=60\text{ V}, I_E=0$                                                       |      |      | 100   | $\mu\text{A}$ |
|                                      |               | $V_{CB}=80\text{ V}, I_E=0$                                                       |      |      | 100   |               |
| Emitter cutoff current               | $I_{EB}$      | $V_{EB}=7\text{ V}, I_C=0$                                                        |      |      | 2     | mA            |
| Collector-emitter voltage            | $V_{CE}$      | $I_C=30\text{ mA}, I_B=0$                                                         | 60   |      |       | V             |
|                                      |               |                                                                                   | 80   |      |       |               |
| DC current gain                      | $h_{FE1}$     | $V_{CE}=3\text{ V}, I_C=4\text{ A}$                                               | 1000 |      | 10000 |               |
|                                      | $h_{FE2}$     | $V_{CE}=3\text{ V}, I_C=8\text{ A}$                                               | 500  |      |       |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=4\text{ A}, I_B=8\text{ mA}$                                                 |      |      | 1.5   | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=4\text{ A}, I_B=8\text{ mA}$                                                 |      |      | 2     | V             |
| Transition frequency                 | $f_T$         | $V_{CE}=10\text{ V}, I_C=0.5\text{ A}, f=1\text{ MHz}$                            | 20   |      |       | MHz           |
| Turn-on time                         | $t_{on}$      | $I_C=4\text{ A}, I_{B1}=8\text{ mA}, I_{B2}=-8\text{ mA}$<br>$V_{CE}=50\text{ V}$ |      | 0.5  |       | $\mu\text{s}$ |
| Storage time                         | $t_{stg}$     |                                                                                   |      | 4    |       | $\mu\text{s}$ |
| Fall time                            | $t_f$         |                                                                                   |      | 1    |       | $\mu\text{s}$ |

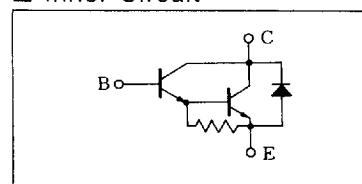
\* $h_{FE1}$  Classifications

| Class     | R           | Q           | P            |
|-----------|-------------|-------------|--------------|
| $h_{FE1}$ | 1000 ~ 2500 | 2000 ~ 5000 | 4000 ~ 10000 |

## Package Dimensions



## Inner Circuit



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Panasonic